

1st Semester Exam Review Packet 2013

To help you study and prepare for the exam, fill out and study this guide. ALSO, please go back and review ALL your notes, tests, quizzes and lab activities.

Terms you should know and understand: Be able to define the following terms and whenever possible be able to give examples of how each term is used in physics and/or the real world.

Define the following terms dealing with motion

- a. Frame of reference
- b. Force
- c. Balanced Force
- d. Unbalanced Force
- e. Net Force
- f. Force diagram or Free body diagram/Adding or Subtracting forces
- g. Speed
- h. Average Speed
- i. Constant Speed
- j. Velocity
- k. Acceleration
- l. Friction

m. Inertia

n. Weight compared to Mass

o. Gravity

p. Newton

q. Joule

r. Kinetic energy

s. Gravitational Potential energy

t. Law of Conservation of Energy

1. Sketch the Electromagnetic spectrum labeling the different types of waves. (Include visible light and all its individual colors) Label on your drawing where energy, and frequency are highest. Also label where the wavelengths are the longest.

2. Define and give an example of:
thermal energy

temperature

heat transfer

3. Draw, explain and give examples of each of the following thermal energy transfers:

Conduction

Convection (density's role)

Radiation

4. Compare and contrast a transverse wave to a compressional/ longitudinal wave:

5. Draw a standing wave and label and explain the following; Crest, Trough. Wavelength. Amplitude, Frequency, equilibrium or rest position.

6. Compare and contrast mechanical waves to electromagnetic waves.

7. Draw, explain and give an example of the ways waves interact:

Reflection

Refraction

Testing Your Knowledge and Terminology: Use scientific terms to fill in the blanks below.

8. Objects at rest will remain at _____, and objects in motion (in a _____ line at a constant _____) tend to remain in _____ unless acted upon by an _____ force.

This statement is also known as Newton's _____ law of motion.

9. If an object is speeding up, slowing down or changing direction the object is _____.

10. _____ is the natural tendency of an object to remain at rest or to remain moving with constant speed.

11. Velocity is speed in a given _____.

12. A _____ is a push or pull.

13. If you have an unbalanced force on an object, the object will _____.

14. Force is measured in _____.

15. The formula for force is _____.

16. Weight is a product of its mass and its acceleration due to _____

17. Acceleration due to gravity here on Earth is _____ m/s^2 .

18. If a force remains constant and the mass of the object is increased, according to Newton's _____ law of motion, the acceleration of the object will _____.

19. If the mass of an object remains constant and the force applied to the object is increased, the acceleration of the object will _____.

20. According to Newton's 3rd law of motion, forces always occur in _____. For every applied force there is an _____ and _____ force.

21. When you push down on a step to go up the stairs, the _____ pushes back on you.

Formulas, Equations, and Other Fun Things To Know & Practice

If you would like this worksheet to help you study for the exam, be sure to write out the formulas, show all your work, and LABEL your answers. Answers only will not be of much help when trying to look for how to solve a problem.

<u>Distance</u>	<u>Time</u>
10 meters	2.03 sec
20 meters	3.89 sec
30 meters	5.19 sec

Use the above information to calculate and answer questions 22-24:

22. What is the split time for each interval & what is the average speed for the interval.

Interval (Split)	Average Speed (m/s)
0-10 meters	
10-20 meters	
20- 30 meters	

23. What interval has the fastest speed? _____

24. What is the object's average speed for the entire distance? Show your work.

25. If the frequency of a wavelength is 32 hertz, the wavelength is 10 meters and the amplitude is 5 meters, what is the speed of the wave? Show all your work and label your units.

26. Draw a plane mirror and show correctly how a laser or ray is reflected off the mirror. Label the ray of incidence ray of reflection and the normal. Measure both angle of incidence and reflection to prove that your drawing is correct.

27. Show how a laser or ray can be refracted through an acrylic block. Explain how one knows if the light is speeding up or slowing down through a medium?

28. What are some factors that determine the speed of a wave through a medium? Be specific.

29. Take two identical objects that look like rocks. One is a real rock that has a very large mass and the other is a styrofoam rock that has a very small mass:

Which one will fall faster?

Which one will accelerate faster if pushed with an equal amount of force across the room?

Which one will weigh more?

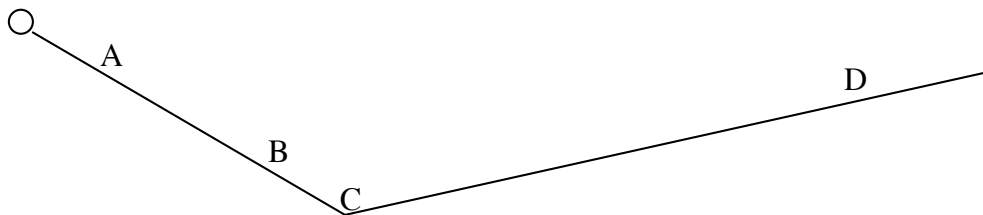
Which one has more inertia?

30. If a football player has a mass of 123 kg and net force of 861 Newton's, what is his acceleration?

31. If a car can go from 0 m/s to 60m/s in 30 seconds, what is it's rate of acceleration?

32. Draw a force diagram of an object that was tossed into the air.

Look at the diagram below to answer questions 33-35:



33. Place the letters in order from LOWEST Kinetic energy to HIGHEST K.E. _____

34. If the ball has a mass of 22kg and it is at a height of 12 meters at letter A, what is its G.P.E.? Show work below.

35. What is the total energy at position A? _____J

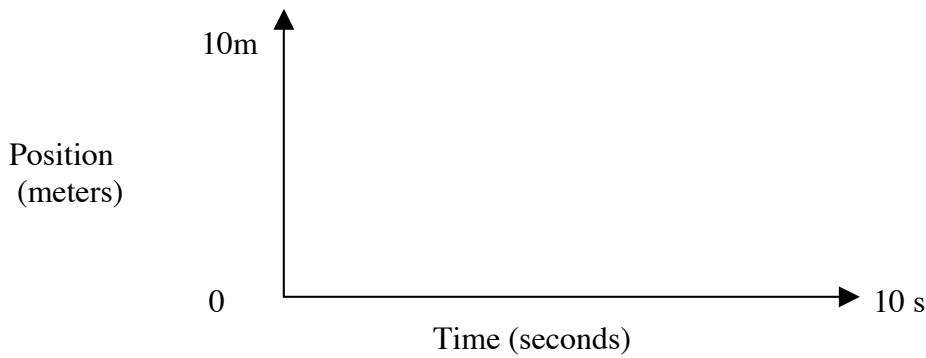
36. Look at the following diagram and explain what will happen to the ball on the right side if there is **NO friction**.



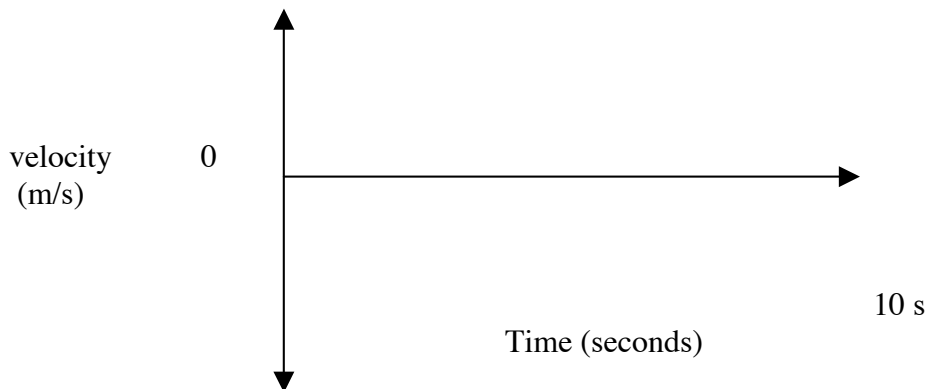
Explain below:

37. Look at the above picture. What would happen if there were friction. Explain.

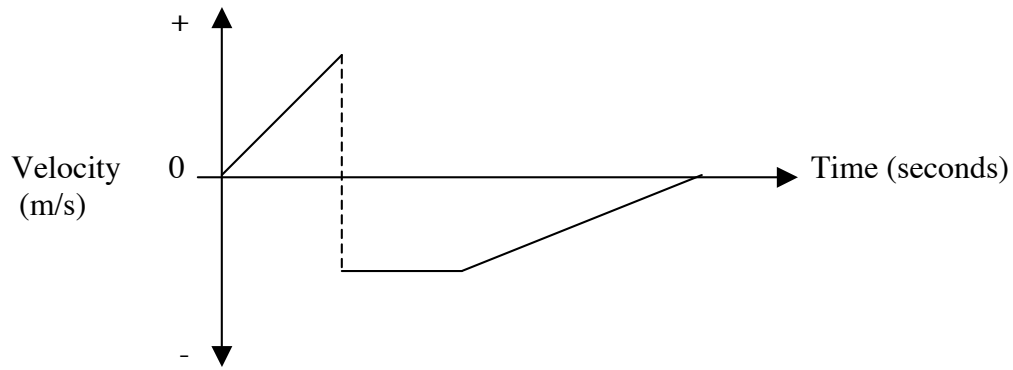
38. Draw a position-time graph that shows an object moving at a fast constant speed away from the origin, stopping for a few seconds then accelerating toward the origin (slow to fast).



39. Draw the same situation in #38 on a **velocity-time** graph.



40. Look at the velocity-time graph below and write out the motion of the object. Be sure to explain if the motion is toward or away, constant or accelerating.



Explain the motion:

41. State and give an example of Newton's 1st Law of motion.

42. State and give an example of Newton's 2nd Law of motion.

43. State and give an example of Newton's 3rd Law of motion.

Be sure to know the following concepts and how they relate to physics and the activities we did in class. Use your past notes, labs activities and assessments to review these concepts.

Be able to determine average speed, split time and acceleration of an object.

Understand position-time and speed-time graphs.

Know the definitions for conduction, convection and radiation. Know how they work in terms of energy transfer. Be able to give or identify examples of each.

Know what an independent variable, dependent variable, constants and control is in an experiment. Be able to identify each or write an experiment using each appropriately.

Know the difference between compressional (longitudinal) and transverse waves. Be able to label the parts of a wave and be able to determine its speed, frequency or wavelength.

If you have any questions while taking the exam, PLEASE ask your teacher for clarification. They can't give you the answer but they can help you understand what is being asked. Be sure to get a good night sleep before the exam and eat a healthy breakfast before you come in.

The Physical Science teachers would like to thank each and every one of you for all the effort and time you have put into this class. Please stop by and visit next year and let us know how you are doing in Biology (or any other science class you might be taking). NOW before you think you are done - **Go back and double check all your answers to be sure you have not made any careless mistakes. Did you show all your work and label all your answers correctly? DO NOT LEAVE ANYTHING BLANK..... ask for help!**